poor farmers in Africa and are managed by habitat management or push–pull strategies, in which *P. purpureum* cultivars and hybrids are used as a trap crop. The AFLP analysis of 145 individuals, collected mainly in Africa, a few from the USA and one from China, were done with primer combinations *Mlu*I/*Mse*I on an ABI 3130 *x*l Genetic Analyzer. The cultivars did not cluster according to geographical origin, and cultivars of a given name did not always cluster together, indicating diversity within the cultivar or misidentifications. This study suggests poor gene pool management at nurseries which negates the potential of AFLPs as a powerful tool for DNA fingerprinting Napier grass. The need to properly administer gene pool collections cannot be stressed enough.

doi:10.1016/j.sajb.2008.01.159

Mite (Acari) diversity in the infructescences of *Protea* species

N. Theron[a,c], L.L. Dreyer[b,c], F. Roets[b,c], K.J. Esler[a]
[a]*Department of Conservation Ecology and Entomology, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa*
[b]*Department of Botany and Zoology, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa*
[c]*Forestry and Biotechnology Institute (FABI) and DST/NRF Centre of Excellence in Tree Health Biotechnology (CTHB), University of Pretoria, Pretoria 0002, South Africa*

The Cape Floristic Region (CFR) is one of the 36 recognized international biodiversity hotspots and includes both the Succulent Karoo and Fynbos Biomes. Within the CFR, the Fynbos Biome is not only an important plant species-diversity asset, but is also of substantial economic importance in the beekeeping, eco-tourism and the cut-flower industries. *Protea* species frequently dominante fynbos vegetation and are the most important genera in the cut-flower industry. It has been shown that mites are important vectors in complex Protea–Ophiostomatoid fungal mutualisms present in southern Africa. They may affect these systems either as dispersal agents, as fungivores protecting seeds against fungi or as predators acting as bio-control agents. Mite systematics and ecology in general, and in fynbos in particular, is very understudied. Virtually nothing is known about their interaction with *Protea* species. This preliminary study sets out to investigate the diversity of mites associated with *Protea* species in the Fynbos Biome. The key questions addressed is a) how do environmental and ecological factors influence mite communities within *Protea* spp. infructescences? b) is there any evidence of co-evolution between mites and *Protea?* and finally, c) does the phylogenetic tree of the mite genus *Tarsonemus* correlate with that of the genus *Protea*. This study aims to determine the key elements of the fynbos–protea–mite system and will form the basis to guide future studies.

doi:10.1016/j.sajb.2008.01.160

Anti-HIV screening of ethnobotanical selected SA plants

T.E. Tshikalange[a], J.J.M. Meyer[a], T. Hattori[b], Y. Suzuki[b]
[a]*Department of Plant Science, University of Pretoria, Pretoria 0002, South Africa*
[b]*Division of Respiratory and Infectious Diseases, Department of Internal Medicine, Graduate School of Medicine, Tohoku University, Sendai, Japan*

Six ethnobotanical selected medicinal plants used in the treatment of sexually transmitted diseases were screened for their anti-HIV activity using the MAGI cell assay. The plants investigated were *Elaeodendron transvaalense* (roots, stem and leaves), *Faurea saligna* (roots), *Parinari curatellifolia* (stem), *Senna petersiana* (Pods), *Terminalia sericea* (roots) and *Xanthoxylum dayvi* (leaves). The ethanol root extract of *E. transvaalense* (IC_{50}=0.01 ng/ml), *Terminalia sericea* (IC_{50}=0.6 ng/ml) and *Xanthoxylum dayvi* (IC_{50}=1.0 ng/ml) showed significant anti-HIV activity. The cytotoxicity of all the extracts was also determined on a CCK5 cell line using the Dojindo cell counting kit-8 (CCK-8). Only the leaves extracts of *E. transvaalense* showed to be toxic at the lowest concentration tested (0.1 ng/ml).

doi:10.1016/j.sajb.2008.01.161

Genetic relationships between South African *Solanum retroflexum* and other related species using partial 18S sequencing

E. Van der Walt, A. Van Schalkwyk, D.K. Berger
Department of Plant Sciences, University of Pretoria, Pretoria 0001, South Africa

The *Solanum nigrum* complex is an emerging, important food source in parts of Africa. Yet in Europe the plant carries a negative, poisonous stigma. It is now believed that the edible plants, *S. americanum, S. scabrum, S. villosum* and *S. retroflexum* in some parts of Africa belongs to an intraspecific taxon of the edible *S. scabrum*, rather than the poisonous *S. nigrum.* Genotyping of selected *Solanum retroflexum* as well as related species were performed using Diversity Array Technology. Based on the 2024 polymorphic features identified with DArT the accessions located in the *Solanum nigrum* complex were divided into 2 distinct groups, separating serrated-leaf *Solanum retroflexum* from smooth-leaf *Solanum chenopodioides.* These 2 groups were again distinct from a group of *Solanum sp.* containing small berries. An additional analysis was performed by sequencing the 18S ITS region of all the accessions. This one gene sequencing was compared to the whole genome DArT analysis and similar Neighbor-joining groups were obtained. The aim of this study was to determine if the 18S ITS region would be a suitable candidate gene for single gene genotyping of *Solanum sp.* The sequencing analyses were subsequently expanded and the results obtained after analyzing 18 various *Solanum* sp. indicated that relatedness based on morphological typing could be validated by sequencing the single 18S ITS gene.

doi:10.1016/j.sajb.2008.01.162

Alternate explants for germplasm cryopreservation of recalcitrant-seeded species: Problems and perspectives

D.B. Varghese, P. Berjak, N.W. Pammenter
Plant Germplasm Conservation Research Group, School of Biological and Conservation Sciences, University of KwaZulu Natal Durban, South Africa

Many African plant species are reported to produce short-lived, recalcitrant (desiccation-sensitive) seeds. Long-term storage is impossible for these seeds, and hydrated storage facilitates viability retention for short periods only. The only option for long-term conservation of the genetic resources of recalcitrant-seeded species is by cryostorage — generally in liquid nitrogen. Excised embryonic axes are usually amenable for cryopreservation. However, in several cases, embryonic axes of mature recalcitrant seeds are themselves large structures and therefore cannot be used as explants for cryostorage. In other cases, even if embryonic axes are small, the shoot apices have proved to be lethally affected by dehydration and liquid nitrogen immersion. In all such species, only explants alternative to zygotic axes can be used for cryopreservation, but these must have a high capacity for plantlet formation once retrieved from cryostorage. The current contribution discusses our experience, and highlights problems encountered with the use of nodal explants and somatic embryos as alternative explants for cryopreservation. Success was attained in developing protocols for establishment of sterile *in vitro* cultures from seeds, multiplication of cultures using RITA® vessels for faster bulking up of the bud clusters and *in vitro* rooting of shoots. But further pre-treatments like flash-drying, sucrose pre-culturing followed by different cryopreservation strategies were not successful, possibly because of the very high water contents of the tissues, even after different pre-treatments. Research on cryopreservation of nodal explants and somatic embryos of *Theobroma cacao*, *Barringtonia racemosa*, *Garcinia*

livingstonei, and *Trichilia* spp. have yielded no success, which indicates that cryopreservation of alternate explants from tropical tree species, is difficult and cannot be compared with that of temperate tree species. Presently, our research is focused on developing a suitable *in vitro* regeneration protocol for meristems and shoot tips for these species, followed by their cryopreservation, for *ex-situ* conservation of germplasm of recalcitrant-seeded species.

doi:10.1016/j.sajb.2008.01.163

The African key project: Gateway to African plants

J.E. Victor, D. Kirkup
South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa

This project seeks to build an interactive, user-friendly and widely accessible tool that will facilitate identification of African plant genera. The key, which will be constructed in either Delta or Lucid, will lead the user to the genus of the plant. From there, links will be provided to facilitate identification to species level. There will also be links to definitions and images of characters, and at genus level, images of examples of species in the genus. This project brings together several African, American and European institutions who are committed to increasing the understanding of African plant diversity. Contributions from South African botanists are sought, and capacity-building workshops will be held in South Africa for troubleshooting problems with scoring characters as well as for extending training in key software such as Lucid. Through co-operation with partners and contributors, we aim to have a product substantial enough to be launched at AETFAT in Madagascar in 2010.

doi:10.1016/j.sajb.2008.01.164

Conservation of medicinal plant species: The role of reserves

M. Walters[a], Y. Steenkamp[b], T.H. Arnold[b], J.E. Victor[c]
[a]*Biosystematics Research and Biodiversity Collections Directorate, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa*
[b]*Data Management, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa*
[c]*National Herbarium, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa*

There are over 2200 indigenous plant taxa in South Africa that are recorded as having medicinal use. Various plant taxa are harvested to different degrees, depending on the current demand for those species. The exploitation of plants for traditional medicine can result in declines of some species. In certain instances, plant species can become threatened with extinction as a result. We chose 20 commonly used medicinal species, threatened to various degrees for analysis of protection status. Distribution data were extracted from the Pretoria Computerised Information System (Precis) and localities mapped and related to protected areas. Levels of protection and gaps in protection status are highlighted and discussed.

doi:10.1016/j.sajb.2008.01.165

Does species richness and diversity of serpentine vegetation differ from the surrounding non-serpentine vegetation?

S.D. Williamson, K. Balkwill
School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Private Bag 3, Wits 2050, Johannesburg, South Africa

One of the factors determining conservation value of an area is the plant species diversity. Seven serpentine outcrops of the Barberton Greenstone Belt in Mpumalanga were selected and Modified-Whittaker plots were placed at each site recording the number of taxa and their relative abundance in each plot. Species richness of serpentine vegetation is shown to be slightly lower than the surrounding non-serpentine vegetation. Each site shows a different level of diversity when compared to the adjacent non-serpentine vegetation, with only one site showing significantly higher serpentine vegetation diversity.

doi:10.1016/j.sajb.2008.01.166

Floristic links between the West Coast and South Coast (South Africa) — Is the Breede River Valley a migration route?

J. Zietsman, L.L. Dreyer, L. Mucina
Department of Botany and Zoology, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa

The Breede River Valley (BRV) (characterized by remarkably heterogenic landscapes) comprises several distinct vegetation types which support highly diverse floras. Moreover, this unique river valley forms a lowland link between the western and southern coastal lowland regions of Greater Capensis. Several affinities of this valley with the bordering coastal regions induced the hypothesis that the BRV might have functioned as a migration corridor for plants between the West Coast and South Coast. The main aim of this research is to characterize the patterns of floristic and vegetation diversity in the BRV through a large scale diversity assessment. In particular, vegetation types that are shared between the BRV, West and South coasts (Shale Renosterveld, Sand Fynbos and Saline vegetation units) are being investigated and compared in terms of alpha diversity, beta diversity, species composition overlap and endemism. These should enable the identification of specific habitat corridors that specific plants could have utilized for migrations. The identification of nodes of high alpha diversity and endemism throughout the study area may aid in the recognition of botanically important areas that need to be prioritized for conservation. In addition, the spatial distribution of genetic variation for populations of plant taxa with known distribution ranges that span the BRV and both the particular coastal regions are being assessed. The distribution of genetic profiles of such taxa should reveal migration directionality through the study area.

doi:10.1016/j.sajb.2008.01.167